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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,856	08/18/2003	Martin Freitag	MUH-12720	3363

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EXAMINER	
GRAHAM, KRETELIA	

ART UNIT	PAPER NUMBER
2827	

DATE MAILED: 06/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H:A

Office Action Summary	Application No.	Applicant(s)	
	10/642,856	FREITAG ET AL.	
	Examiner	Art Unit	
	Kretelia Graham	2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 August 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/18/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

Reference to FIG. 2A-2E of US patent 3,375,503 **(see page 2, lines 4-5)** is made, but no FIG. 2A-2E exist in the named patent.

Appropriate correction is required.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **FIG. 4: i' (see page 13, line 22)**. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Pertaining to claims 1, 2, and 4, the term "temporally offset" in **(claim 1, line 16), (claim 2, line 4), and (claim 4, line 15) is** a relative term which renders the claim indefinite. The term "temporally offset" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The examiner is uncertain of the degree, magnitude, or direction of the write current applied to the write word line and write bit line.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by the US patent to Nakao (6,509,621 B2).

Pertaining to claim 1, **FIG. 3A and 9A-9D** are directed towards: A method for writing to magnetoresistive memory cells of an MRAM memory, the magnetoresistive memory cells having a multilayer system containing layers **1-3** stacked one above another, the layers including a soft-magnetic layer **2**, a hard-magnetic layer **1** and a tunnel oxide layer **3** disposed between the soft- magnetic layer and the hard-magnetic layer, which comprises the steps of: impressing write currents **IWx, IWy** being in each case impressed on a respective word line **4** and a respective bit line **5** resulting in a superposition of magnetic fields generated by the write currents, and in each selected memory cell selected by the respective word line and the respective bit line, a magnetic field leads to a change of a magnetization direction of only the soft-magnetic layer **see column 5, lines 6-11**, the write currents being impressed on the respective word line and the respective bit line in a manner temporally offset with respect to one another, resulting in the magnetization direction of the soft-magnetic layer in the selected memory cell being rotated in a plurality of successive steps in a direction desired for writing a logic "0" or "1" **see column 9, lines 46-67 – column 10, lines 1-12; Note: It is inherent to write either a logic "0" or logic "1" to a memory cell**. This claim is rejected in light of the term "temporally offset" rendering the claim indefinite as discussed above in item 4.

Pertaining to claim 2, **column 9, lines 46-67 – column 10, lines 1-2** are directed towards: impressing the write currents for the selected memory cell in each case in

approximately a same duration and in a manner temporally offset with respect to one another.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the US patent to Nakao in view of the US patent application publication to Perner et al. (6,363,000 B2).

Pertaining to claim 3, Nakao discloses all of the claim limitations except: writing the logic "1" to the selected memory cell with a bit line write current of the respective bit line flowing in a same current flow direction as a word line write current of the respective word line and the bit line write current being impressed in a delayed manner relative to the word line write current of the respective word line. Perner discloses: writing the logic "1" to the selected memory cell with a bit line write current of the respective bit line flowing in a same current flow direction as a word line write current of the respective word line and the bit line write current being impressed in a delayed manner **column 7, lines 47-59** relative to the word line write current of the respective word line **Note: The bit line current direction is determined by the value of data to be written (see column 7, lines 7-24), which may be a logic "0" or logic "1" (see column 1, lines**

28-33 and column 4, lines 36-39). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the writing method of Nakao with writing method of Perner, since Perner indicates at **column 8, lines 63-67 – column 9, lines 1-6** that such a modification provides controllable, bi-directional write current pulses to selected word lines and bit lines without exceeding breakdown limits of the memory cells.

Pertaining to claim 4, **FIG. 3A and 3B** of Nakao discloses: an array **6** containing magnetoresistive memory cells **see FIG. 3A and column 5, lines 49-52** each having a multilayer system with layers **1-3** stacked one above another, said layers including a soft-magnetic layer **2**, a hard- magnetic layer **1**, and a tunnel oxide layer **3** disposed between said soft-magnetic layer and said hard-magnetic layer; word lines **4**; bits lines **5** crossing said word lines at each of said magnetoresistive memory cells; and resulting in a magnetization direction of only said soft-magnetic layer of said respective memory cell being rotated in a plurality of successive steps in a direction desired for writing a logic "0" or "1" **see FIG. 9A-D and column 9, lines 46-67 – column 10, lines 1-12**. However Nakao fails to disclose: a writing control circuit for impressing write currents in each case onto a respective word line and a respective bit line of a respective memory cell selected for writing, said writing control circuit having a write circuit for impressing the write currents in each case on said respective word line and said respective bit line in a manner temporally offset with respect to one another. **FIG. 1** of Perner discloses: a writing control circuit **24** for impressing write currents in each case onto a respective word line and a respective bit line of a respective memory cell selected for writing, said

writing control circuit having a write circuit **26-32** for impressing the write currents in each case on said respective word line and said respective bit line in a manner temporally offset with respect to one another **see column 4, lines 26-28 and column 3, lines 54-67 – column 4, lines 1-5**. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the device of Nakao with writing circuits of Perner, since Perner indicates at **column 8, lines 63-67 – column 9, lines 1-6** that such a modification provides controllable, bi-directional write current pulses to selected word lines and bit lines without exceeding breakdown limits of the memory cells. This claim is rejected in light of the term "temporally offset" rendering the claim indefinite as discussed above in item 4.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kretelia Graham whose telephone number is (571) 272-5055. The examiner can normally be reached on Mon-Fri 8am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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